

CLAIMS

I claim:

- [c1] 1. A method for analyzing performance of a communications network, comprising:
- receiving predetermined data collection criteria, wherein the predetermined data collection criteria designate particular call quality data to be captured from particular mobile units during a particular time period;
- querying the designated mobile units during the designated time period;
- receiving call quality data and location data with respect to the mobile unit;
- processing the call data and location data, including creating a link between the call data and the location data; and
- transmitting the call data, the location data, and the link to a location server.
- [c2] 2. The method of claim 1, wherein the call data includes:
- time data;
- serving base station data;
- control channel data;
- traffic channel data;
- signal strength data;
- bit error rate data; and
- handoff data.
- [c3] 3. The method of claim 1, wherein the location data includes a location of the mobile unit as determined using global positioning system equipment.
- [c4] 4. The method of claim 1, wherein the location data includes a description of a location of the mobile unit that is compliant with the requirements of enhanced 911 ("E911") services.

[c5] 5. The method of claim 1, wherein the location data includes a description of a location of the mobile unit as calculated using a time difference of arrival ("TDOA") method.

[c6] 6. A mobile unit for use in a wireless communications network, comprising;

an operating system, including hardware and software that performs communications functions;

call quality data components to determine at least one call quality metric, and

a location system, comprising hardware and software that determine a location of the mobile unit in compliance with enhanced 911 ("E911") requirements, wherein the location system,

receives a query from a switch, wherein the query includes a request for call data and location data, wherein the location data comprises a location of the mobile unit in compliance with E911 requirements; and

transmits the location data and the call quality metric to the switch in response to the request.

[c7] 7. The mobile unit of claim 6, wherein the location system includes global positioning system equipment.

[c8] 8. The mobile unit of claim 6, further comprising a performance monitoring system that monitors and stores multiple network performance characteristic measurements.

[c9] 9. A method for analyzing a wireless communications network in real-time, comprising:

receiving performance monitoring criteria;

using the performance monitoring criteria to query at least one mobile unit in the wireless communications network;

receiving at least one response to the query, including call data and location data;

creating a link between the call data and the location data;

storing the call data, the location data, and the link in a server;

accessing the server to retrieve the call data, the location data, and the links;

using the call data, the location data and the links to create at least one performance report, including a graphical report that displays the call data as a function of location and time, wherein the location is a location of a mobile unit with a resolution required by enhanced 911 ("E911") services, and the time is a time at which the call data was created and at which the mobile unit was in the location.

[c10] 10. The method of claim 9, further comprising automatically adjusting parameters of the wireless communications network based on the at least one performance report and predetermined performance guidelines.

[c11] 11. The method of claim 10, wherein the parameters include power settings of network components, and frequency assignments.

[c12] 12. A wireless communications system, comprising:

at least one mobile unit, wherein the mobile unit includes a location system that creates location data describing a location of the mobile unit;

at least one switch in communication with the at least one mobile unit;

at least one server in communication with the at least one switch, wherein the at least one switch receives network performance data and location data from the at least one mobile unit in response to a request, and wherein the network performance data characterizes network performance from the at least one mobile unit's point of view at the location data during a period of time.

[c13] 13. The wireless communications system of claim 12, wherein the at least one server comprises a user interface server that executes a graphical user

interface ("GUI"), wherein the request is formulated using the GUI to specify particular network performance data to be captured from specific mobile units during a specific period of time.

[c14]

14. The wireless communications system of claim 12, wherein the network performance data includes:

- time data;
- serving base station data;
- control channel data;
- traffic channel data;
- signal strength data;
- bit error rate data; and
- handoff data.

[c15]

15. The wireless communications system of claim 12, wherein the GUI is further used to request performance reports, including accessing the server for specified network performance data and location data, wherein the performance reports include graphical reports that indicate network performance as a function of time and mobile unit location.

[c16]

16. The wireless communications system of claim 12, wherein at least one server further creates a link between network performance data and location data, wherein the location data described a location of a mobile unit from which the network performance data was captured.

[c17]

17. The wireless communications system of claim 13, wherein the request includes criteria that describe which mobile units are queried, and criteria that describe what network performance data is captured.

[c18]

18. The wireless communications system of claim 17, wherein the criteria that describe which mobile units are queried include: specific base stations; specific sectors; specific control channels; specific traffic channels;

specific latitude and longitude polygons; specific dates or times; and random groups of mobile units as identified by an identifier.

[c19] 19. The wireless communications system of claim 17, wherein the criteria that describe what network performance data is captured include: signal strength; path loss; dropped calls; and bit error rate ("BER").

[c20] 20. The wireless communications system of claim 15, wherein the request includes criteria that describe which mobile units were queried, and criteria that describe what network performance data was captured.

[c21] 21. The wireless communications system of claim 20, wherein the criteria that describe which mobile units were queried include: specific base stations; specific sectors; specific control channels; specific traffic channels; specific latitude and longitude polygons; specific dates or times; and random groups of mobile units as identified by phone number (MIN) or electronic serial number (EIN).

[c22] 22. The wireless communications system of claim 20, wherein the criteria that describe what network performance data was captured include: signal strength; dropped calls; and bit error rate ("BER").

[c23] 23. A wireless communications system, comprising:
a mobile unit, wherein the mobile unit includes,
a performance monitoring means that records multiple
network performance characteristics; and
a location means that creates location data describing a
location of the mobile unit with a resolution required by
enhanced 911 ("E911") services; and
a data processing means in communication with the mobile unit,
comprising, means for using the network performance characteristics
and the location data to create at least one performance report,
including a graphical report that displays the call data as a function

of location and time, wherein the location is the location of the mobile unit at the time the network performance characteristics were recorded.

[c24]

24. The wireless communications system of claim 23, wherein the data processing means further comprises:

means for receiving performance monitoring criteria;

means for using the performance monitoring criteria to query the mobile unit; and

means for receiving a response to the query, wherein the response includes the network performance characteristics and the location data.

[c25]

25. The wireless communications system of claim 23, wherein the data processing means further comprises:

means for creating a link between the network performance characteristics and the location data;

means for storing the network performance characteristics, the location data, and the link in a server; and

means for retrieving the network performance characteristics and the location data in response to a request to create at least one performance report.